

Exercise May Improve Brain Function in Kids With Obesity

Tucker M.E.

The study covered in this summary was published in medRxiv as a preprint and has not yet been peer reviewed.

Key Takeaways

Exercise may positively affect intelligence, cognitive flexibility, and academic performance in children aged 8-12 years who are overweight or have obesity.

Why This Matters

Emerging evidence suggests obesity might negatively impact cognition and brain development.

Study Design

A total of 109 children (aged 8-11.9 years) who were overweight or had obesity were randomized; 90 completed post-exercise evaluation and attended \geq 70% of the exercise sessions.

The "ActiveBrains" intervention was three sessions per week of aerobic (60 minutes) and resistance (30 minutes) training over 20 weeks.

Controls received lifestyle recommendations.

Key Results

- Crystallized intelligence improved significantly pre- to post-exercise with ActiveBrains versus controls (0.72 standard deviations (SDs); $P = .0000003$).
- Total intelligence improved significantly more with ActiveBrains (0.62 SDs; $P = .00008$).
- Exercise also improved a composite score of cognitive flexibility based on two cognitive flexibility tests (0.42 SDs; $P = .005$).
- Exercise significantly improved total academic performance, particularly mathematics, problem solving, and academic skills (range, 0.21-0.36 SDs; P values ranged from 0.035 to 0.007).

- Exercise had nonsignificant effects on reading and writing skills and no effect on academic fluency.
- After correction for multiple comparisons, exercise effects persisted for intelligence ($P \leq .001$), cognitive flexibility ($P = .02$), and problem solving ($P = .02$) and were borderline nonsignificant for mathematics, academic skills, and total academic performance (all corrected $P = .07$).
- Intervention had no significant effect on brain MRI outcomes including volumetric analyses of hippocampus subregions and prefrontal cortex, cortical thickness and surface area of prefrontal cortex and subregions, gray matter volumes of subcortical brain structures, and total brain volumes.
- Results were consistent across age, sex, and maturation except that effect on crystallized intelligence was greater in boys and younger/less mature participants.

Limitations

Unknown whether longer interventions are needed to elicit structural or functional brain changes.

Possible bias due to incomplete staff blinding.

Disclosures

This study was mainly supported by grants from the Spanish Ministry of Economy and Competitiveness, European Regional Development Fund, European Commission, and Alicia Koplowitz Foundation.

The authors have declared no competing interests.

This is a summary of a preprint research study "Effects of exercise on brain health outcomes in children with overweight/obesity: the ActiveBrains randomized controlled trial," by Francisco B. Ortega, PhD, of the PROFITH (Promoting Fitness and Health Through Physical Activity) Research Group, Sport and Health University Research Institute, Department of Physical and Sports Education, Faculty of Sport Sciences, University of Granada, Spain, and colleagues. Published on medRxiv and provided to you by Medscape. The study has not yet been peer reviewed.

